RTTY Journal

JULY-AUGUST 1983

VOLUME 31 NO. 6 EXCLUSIVELY AMATEUR RADIOTELETYPE ONE DOLLAR

PICTURED CLOCKWISE FROM TOP LEFT: PAUL, KØPJ (SEE P.9), SKIP, WB6CYA,;RALPH, WA8GDT (See p.12), Bill, K9GWT of HAL, Ed, W9WKC,at Dayton; ?, Bob, WØHAH, Gar, KØGA (VP of ARRL) at Minneapolis ARC; Hank W6SKC, Dusty W8CQ, John K2AGI and Ron W8BBB (See P.9) at Dayton 1979.

PLEASE NOTE THAT THE JOURNAL HAS GONE TOTALLY COMPUTER. ALL SUBSCRIBERS ARE NOW ON LABELS. SOME GOOD SUBSCRIBERS MAY HAVE "FALLEN THROUGH THE CRACKS." IF YOU HEAR OF ANY PLEASE LET US KNOW. THANKS!

RTTY JOURNAL

DEE CRUMPTON, N6ELP formerly KA6NYW
OWNER-EDITOR
POST OFFICE BOX RY
CARDIFF-BY-THE-SEA, CA 92007

JOHN P. GOHEEN, KA6NYK
ASSOCIATE EDITOR

BUSINESS OFFICE
1155 ARDEN DRIVE
ENCINITAS, CA 92024
TELE: 619-753-5647

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JEAN HURTAUD, F8XT
CHILLAC
16480 BROSSAC, FRANCE

DR. ARTHUR GEE, G2UK
21 ROMANY ROAD,OULTON BROAD
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KANJI YAMAMURA, JH2FHX
2 42 UMENOKI, IZUMI-MACHI
TOKI-CITY, GIFU-PREF
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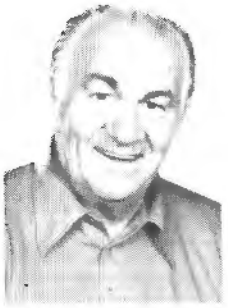
DX RTTY



"THERE"S A RARE ONE!"

BY BILL

WØLHS SNYDER, 1514 S. 12th Street, Fargo, ND 58103

"BUT UNDER A MAILBOX!"

Summer brought a change in high-frequency propagation. Whether it is good or bad depends where you live, I guess. So lets hope it is good! Summer also brought some interesting QSL information. Along with his card, DJ6QT/CT3 enclosed some interesting statistics on his operation from Madiera Island in 1982. The information was rather cryptic, but here is my interpretation of it: Walter made 8000 QSO's on 9 bands in various modes. 470 were on RTTY using 5 bands. He worked the USA on all bands 80 through 10, and he worked 47 countries and all continents. He made 100 contacts with DL, 81 with the USA (all districts), 58 with Italy, 17 with G, 22 with ON, 21 with JA, 15 with EA, 14 with SM, 11 each with F and OH, 6 with Y, plus 5 each with PY, OE, YO, and IS. All the other countries were represented by 1 to 4 QSO's. Among the goodies worked in the last catagory were ZB2, 4X4, UB, and 9M2. The QSL cards from Walter have been distributed and this has given a lot of stations a "new one!"

In May I received a very nice letter from Arliss, W7XU, and well-known for his activities from the geographical South Pole as KC4AAA during the 1982 winter-over season (as they say in scientific circles.) Here's a quote from his letter:

"Apparently some cards sent to and from the South Pole were lost in the mail. Those who did not receive QSL's for contacts made from 5 November 1981 through 5 November 1982, can claim those cards by sending an SASE to WB9RRT, Larry (another of the winter-over group.) Larry and I are very aware of the difficulty that many have experienced in the past when attempting to confirm KC4AAA QSO's, but we guarantee a confirmation of any contact made during the time period mentioned (this applies to CW and SSB contacts, as well as RTTY.)"

I am happy to pass Arliss' information along, and wish we could do the same for Guantanamo Bay operations. Arliss also tells of his bicycling through New Zealand, Australia, Singapore, Sumatra, Malaysia and Hong Kong after he was liberated from the ice and snow of the South Pole. He says he met a number of hams along the bike route, but none were active on RTTY. Arliss is back on the air from his Oregon home with a new FT-980. We'll be looking for some interesting contacts with him, and we thank him for those great chats we had with him in the Antarctic.

While on the subject of QSL cards, K7BV, Mac, back from a rollicking good trip to the east coast, gives this advice to QSL chasers: "green stamps are okay to run-of-the-mill foreign countries. However, they are a no-no to those who are unfriendly with the USA, i.e. Iran, Pakistan, USSR and the middle east in general. In case someone is caught with US money, it could be a capital crime. And, I would hate to lose a rare one that way!"

The mail brought us a fine letter from Enno, XT2AU, who tells us ham radio is his favorite pastime, especially since he discovered RTTY in 1982. He says he has a problem getting a balance between his hobby and family-life. You are not alone in that department, Enno. Enno had some nice words to say about the deportment of the RTTY group, to wit: "There is more politemess than elsewhere. Of course, when I see a weak and rare signal on my screen and I establish contact and then somebody steps onto that signal with a two-minute sequence of RY's and/or QBF's, then I lose my temper adn yell! Fortunately the TONO 7000E isn't yet equipped with voice-to-RTTY transfer!" (Editor's note: I'm still advocating the elimination of the RY and QBF key from all RTTY gear. They were used originally for channel-holding and testing the old TTY machines, and are now the source of much irritation to many of the older RTTY fans. Frankly, you don't need to put RY's ahead of a call, try getting your calls as short and quick as possible.)

Enno also passes on this information about the others in XT land: He is about the only active station in the country now. XT2AW is more on CW, XT2AE no longer has RTTY gear, and XT2AY and AZ have left the country. Enno, by the way, can be QSL'd via WA1ZEZ.

I would like to nominate Enno for some kind of a DX award. One night I watched him work six stations after he vowed to go QRT. He did pause to get a beer, though. Enno says he speaks 10 languages. "Languages are like keys when you go to a foreign country--they open the door!" he said in one QSO. In another he printed :" :JT1AA is a pirate. Here. Here we are back in the middle ages, hunting pirates!"

If you have been reading my column for the last year, you will probably recall that I have been agitating with some of the ARRL directors to endorse the DXCC RTTY award. Well, at the April meeting of the board

PLEASE TURN THE PAGE

they did have a resolution introduced and seconded to endorse the RTTY DXCC award for higher levels of achievement than just 100 countries, but before it was voted on, the matter was referred to the DX advisory committee for study. The DXAC was to report on its findings by the second meeting of the board in 1983. I have always wondered how many RTTY ops we have on the DXAC, so I really don't know if they understand our problem in getting the endorsements. So far the League has only issued about 50 DXCC awards, so now is the time to expand the endorsement procedure if they are ever going to do it. So, I suggest all of the DXers in the RTTY clan get busy and ring out the bell over the head of your DXAC committeeperson. I did it in person to our Dakota member.

W2PSU, Ken, who has long been pestering his ARRL directors about above subject, asks that interested people in the Hudson division write to W2QM, Dave, and explain your feelings about endorsement of the award.

KB2VO, George, is another one who is plugging hard for the DXCC endorsement by the ARRL. George sent along a nice list of DX worked/heard which includes 5B4CV on Cyprus, 2130 on 14Mhz; 5T5RY, Sunday 0000Z on 14095--QSL via F6FNU; HK4CCX, weekend evening on 20, mornings on 21 at about 1300Z; and TG9NR, Saturdays mostly 1500 on 20. QSL via box 3077, Madellin, Columbia.

W3KV, John, has another commandment for RTTY ops to add to the recently published list. It reads: "Thou shall scatter the flock plus ot minus 5 and use thy RIT; should thou be DXpedition or rare DX, else thou create a Tower of Babel."

WB8YJF, Jon, takes time off from his job at iRL to work some of the following goodies: TU2GA, QSL via K9KXA; EA6GV, QSL via box 611, Palma de Mallorca, Baleric IS, Spain; and 9H1E, QSL via boc 144, Valletta, Malta; OX3FG, CB address. Others in Jon's log are ISØLMN, LX1DA, ZS6BVZ, 5Z4DA, EA8AHK and CT1OQ. Jon also reports working a C3Ø station who was begging for stateside calls and not getting one. Jon suggests we listen more and not just get in and send RY's!

W1ZXA, Paul worked WB2OSZ who was impressing his visitors with RTTY communications via computers. According to Paul the big surprise came when the other station said:"what really impressed them (the visitors) is that I have a speech synthesizer connected to the terminal so all data sent to it is spoken!" Paul thinks this is some kind of first in Ham Radio!" And he adds, "What hath modern hi-tech brought?"

GI4AHP, Ted, promised to send along a modification for the TS930 that many of the blokes in his country are using. At press time it hadn't appeared in the postbox, but the mods are gearing to make it work on AMTOR. Ted told me about them on RTTY, but I accidentally erased the tape. Ever have that happen to you?

EAVESDROPPINGS: "Your signals are 20 over mine."...."I hate working low power stations on this mode!"..... "RYRYRYRYRYRYRYRYRY THE QRG IS IN USE RYRYRYRYRYRY ETC."...."The woodpacker is packing wood."...."I'm running a KW now, I'm no longer a friendly neigbor!"...."I've got to QRT quick--lightning!"...."For the log it needs 6 line feeds followed by your call 3 times then 6 line feeds and bring up your carrier within 3 seconds of mine."...."Computers are addictive."...."What they should bring out for RTTY is a MSO eliminator,"... "73 from our louse to your louse,"... ."Okay Hamigo!"...."73 from the hot, humid, sticky, god-forsaken Florida I love!"...."Roger on Walt, Roger on Newt, Roger on George, and Roger on Roger."...."He QRMeth the bands with his religion."...."He has a home-blew rig."....."I am demonstrating the vagaries of Ham radio to non-believers."...."Been playing woodpecker roulette on 20 meters."....."Nice crossing wirelesses with you."...."If the Bible is so prophetic, how come there is no zipcode for God?".....

Wonders which never cease...watched DK7JY work with WB1GMH who was using only 2 watts....watching a mailbox when accessed send 10 lines of QBF... .....watching two Japanese stations conversing in English....wondering if I'll ever get a card from Venezuela?

OZ1CRL, Jorgen, and OZ1AMR, his XYL are back on RTTY after being missing for a year while they were moving to a new house. They have a new 25 meter tower to squirt out the signals.

N1BNK, Bert, reports that UT5RP, Dima, has a new apartment with a special room for radio.

ON4BX, Arthur, now has 218 countries confirmed, and is into AMTOR and is very active.

JA1JDD, Taka, reports that JD1ALN is active from Minami Toroshima on only 15 meters. He can be QSL'd via JR8FOG (that's a great call for a weatherman!) Taka also tells of working 5T5RY, A92DM, TN8CC and T7ØA in San Marino. Operator is I4MKN and can be QSL'd by Box 1, Republic of San Marino.

JA1DSI, Minoru, Was one of the lucky ones for Heard Island. He points out that JD1ALN will be active for 6 months and is on about 0700 to 0800Z on 15 meters.

For you Robot 800 owners, I fixed a key that would occasionally skip a letter when punched. I did it by making a loop of wire, putting it under the key and lifting straight up. The key just pops off and exposes the contacts which can be cleaned. The Robot also now has a modification available that will increase the buffer to over 1000 from 511, makes ten soft-sectored memories available with a total of 640 characters, and provides RS232 output plus battery back-up for the memory. It's a one-evening kit, they say.

W3JF is still awaiting his Egyptian license according to Tony, WB3HAZ,his QSL manager. It has been quite a long wait, since November if memory serves me right.

KA3GIK, Elizabeth and husband Pat, WB3FIZ, report working 9V1UC, Ken in Singapore at 1525Z on 15; 9M2DW, Tan in Malaysia; and 7Z2AP in Saudi Arabia at 2300 on 20. If any DX station is looking for a QSL manager, Elizabeth has made it known that she will be happy to take on the chore

PLEASE GO TO NEXT PAGE

DX COLUMN CONTINUED

for some deserving overseas RTTY fan.

K1LPS, Larry, has been busy designing an FSK interface for the TS-930S and the HAL 2100 system. Larry says it works rather well as does John, W3KV, one of the first to install it.

W3KV sends along a good flood of DX heard and worked. To wit: HC5TU, Box 88, Cuenca; TG9NR; WP4ADA; OX3FG; 8P6PC; VP9JR; PJ3IDP, Irwin, Aruba; SP2FF, Barbara--SP2UU, Andrew; SVØCG, Gil in Athens, home call is W4SQC;SV-1DO; 3A2EE, Jean; FG7XE; FM7BB,Lional Box 10, Trois-Islets; C3ØLB, John,ANdarra, via EA7CJP, Box 452, Jaen, Spain; A4XYK, 9H1E, Box 144, Valletta Malta; 7Z2AP, Alfred, via I8YCP (same as HZ); 5Z4DP, Tony, Mombassa, via G8RQH, 18 Malham Ave, Hull, England; 5Z4DA, Box 30137, Nairobi; 5Z4DD; DU-7RLC; TU3JD; TU2GA; 4X4IX; 4Z4NL; GD-3AHV, George; YB3BLI; YB5AF, Jimmie, Box 94, Padang: ZP5JAL, Box 1311, Ascunsion; and ZP5MJY, Rosario. John also says HL9RQ, Steve, indicates that HL9KT, HL9JV and HL9UR are now active on RTTY. Now you know why John has 210 confirmed on the green key mode!

WØHAH, Bob, joins the crowd who are disenchanted with MSO operations in general. I have been keeping a list of MSO's as I run across them, and I notice new ones popping up all of the time. Bob also wonders how many of them are legal, how many of them have a control operator, Etc. I do too! For example, the other night I copied one on 40 meters which listed 87 messages using 26425 bytes in its directory. When the directory printed out it looked like the want ads in our local newspaper--this for sale, that for sale. Is that not commercial use of Ham radio?? I don't know. If our hobby is going to degenerate into mechanical salesmen, then I'll say "good-bye!" Ham radio is person-to-person, not machine-to-machine. I'm not completely against MSO's, if we are going to have them, them they should be regulated and put in a section of the spectrum where they will not interfere with person-to-person contacts. Nothing makes me madder than finding a DX station, contacting him and then discovering that we are right under a mailbox, where no one seems to ask if the frequency is busy --after all it is a MSO and they act like they "own" the QRG.

N1BNK, Bert is happy with his contact and QSl from ZS3BG, a rare one. Bert says Gerd is active on weekends. He also lists SP2UU, VK9NS, SP3FHT, OX3-FG, HK4CCX and HK3OZ. Bert is waiting for his AMTOR gear and says he should be on in July.

DXCC-RTTY ENDORSEMENTS: 210 sticker to W3KV, John Possehl. 200 sticker to I5WT, Gustavo Pellegrini. 150 sticker to JA1DSI, Dr. Minoru Tsuda.

Anyone with a linear they would like to put to good DXing use? J6LOV is struggling along with home-brew RTTY stuff and only about 20 watts. Errol is putting St. Lucia on the map but with a little extra juice in the antenna would help get those far-away places with strange-sounding names.

In addition to those mentioned above, I would like to thank all those I eavesdropped on, plus W6MI, KA7CQF, CE3CBG, N6EGY, CE3CEW, W5HEZ, KØBJ, JA1ACB, JA3CZY, GW3EHN, YJ8TT, WB9UHQ and F8XT. And as Bob, WØHAH... puts it:"May the DX Gods bless you with many new ones!"
73 de Bill, WØLHS--DIT DIT!

DXCC Award # 79 issued to:
Anthony Vigorita, WB3HAZ 5-1-83

DXCC Award #80 Issued to:
Larry Filby, K1LPS 5-20-83

W.A.C. (ALL BANDS) issued to:
Ray Lowes, G4NJW 23-4-83

W.A.C. (ALL ON 14 METERS) issued to:
102 Laurent Morduan, FM7WO 31-5-83

DXCC Award # 81 issued to:
Katuo Takara, JR6AG 15-6-83

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RELAY SWITCHING CONTINUED

caught up in a lengthy discussion with someone about the swinging contacts and the stationary contacts. Get your terminology straight!

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Ralph O. Irish, WA8GDT
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Ronald Vaceluke, W9SEK
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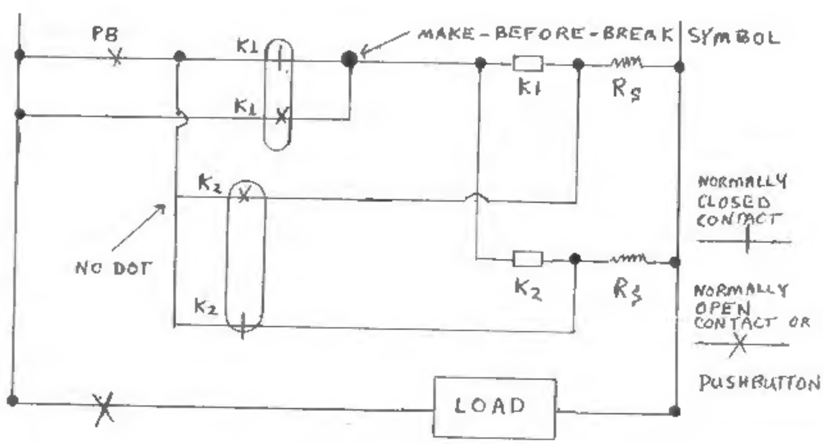
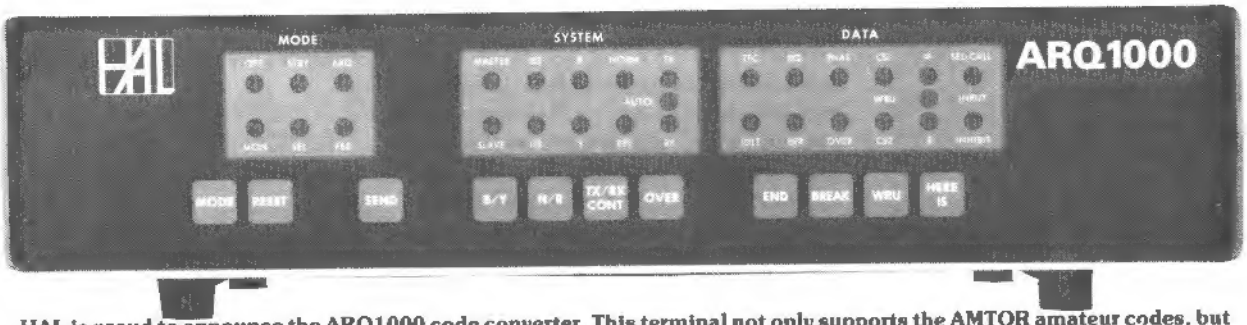


AMTOR RTTY



HAL is proud to announce the ARQ1000 code converter. This terminal not only supports the AMTOR amateur codes, but meets ALL of the commercial requirements of CCIR Recommendation 476-2. The ARQ1000 can be used with present and previous generation HAL RTTY products. In fact, any Baudot or ASCII full duplex terminal at data rates from 45 to 300 baud may be used with the ARQ1000. Some of the outstanding features of the ARQ1000 are:

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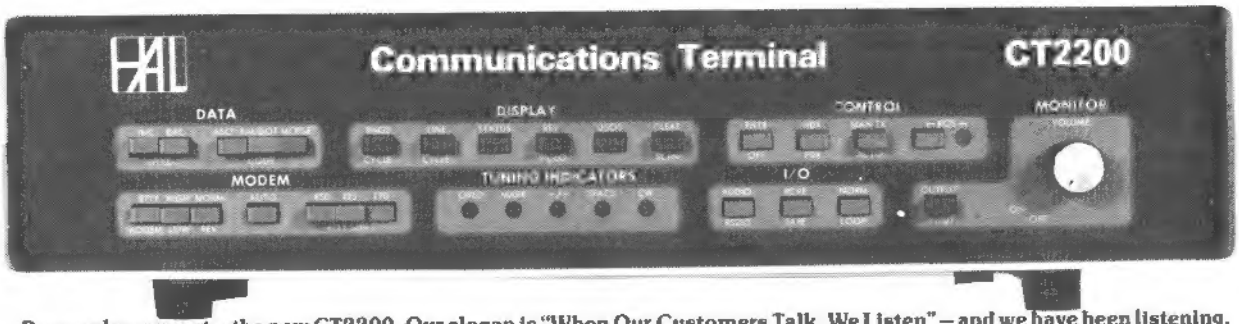
BY POPULAR REQUEST



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HAL CT-2100 INTERFACE

L. L. FILBY, K1LPS
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Properly interfacing RTTY equipment to the modern Amateur transceiver is one of the biggest problems today for the aspiring RTTY operator. Not a day goes by but what the author has encountered at least one or two inverted signals and as often as not, the operator, when informed of the problem, does not know what he can do about it. To make matters worse, the transciever manufacturers even though they make provision for RTTY operation, are often not cognizant of the real life requirements for operating their equipment on RTTY. More often than not, instructions for running their equipment on RTTY are vague and every maker seems to have his own standard as to FSK drive requirements.

This project came about in the course of helping a new station get going on RTTY with a HAL CT-2100 video system and the Kenwood TS-930S, but some of the problems encountered pertain to other makes and models of transciever. We'll talk primarily about FSK although some comparisons will be made to the use of indirect FSK using tones into the microphone.

The TS-930S posed a number of problems with regard to RTTY and interfacing to the HAL system. First of all, the 930S has provision for FSK mode. While it is always possible to run this and other transceivers using tones into the mike jack, receive bandwidth was excessive and was not improved that much using the SSB Slope controls. As for the FSK mode, the data level required for FSK drive in the 930S was not directly compatible with the HAL CT-2100 system. Again, the Kenwood manual is somewhat vague as to the polarity and level of the FSK drive. In that regard, the required drive is zero for mark and a maximum of +5v for space. In other words, TTL level. Examination of the circuitry in the 930S (IC18 of the Digital Board) did not give much of a clue as to proper drive level as I was not familiar with the operation of that IC and had no information on it. In any case, it was found that normal TTL level did drive the FSK input properly. The only output from the CT-2100 is RS-232C as far as data levels are concerned. One of the people at the HAL factory had been successful in putting a 5v Zener diode across the RS-232 output to limit the positive excursion (Space) to that level. However, no matter what method is used to interface the RS-232 level to TTL, you end up with no CW ID data on that output, which wastes a very valuable function in the operating system of the CT-2100. Several discussions were had with Bill Henry and other people at HAL and the bottom line was; "In the case of the TS-930S, settle for audio tones into the mike jack." Besides the question of CW ID when using FSK, there was the question of driving an external Baudot printer. For some unknown reason, the loop output of the CT-2100 would only print the receive side of a QSO, and not what came out of the transmit buffer. At first I thought my unit was defective but then I checked with two other CT-2100 owners and they said that theirs worked the same way. I checked and found that both transmit and receive data was available at the RS-232 output but not of the correct polarity to drive my existing printer -loop interface system which requires inverted RS-232, and of course still no CW ID data. It was somewhat confusing to hear both RTTY data and CW data in the monitor speaker of the CT-2100, but as soon as the CW ID sequence started, the RS-232 line went negative and remained there. To make a long story short, it was found that during CW ID, the data comes out of the CW KEY outputs. After examining the CT-2100 circuitry at length, the interface circuitry to combine both RTTY and CW data into one output was developed. As it turns out, this simple interface can solve several problems encountered in mating up printers, transcievers etc. Not only for the TS-930S but other units as well. I found out that TS-930S owners were faced with the same FSK/CW ID problems, when using the CT-2100 system. The interface board presented here will provide both TTL and ± outputs, normal or inverted polarity and both CW and RTTY data is available.

The circuit is shown in Figure 1. Although the CW and DATA (RTTY) inputs are shown to specific pins of IC1A, it matters not. At rest, both lines are logic high and in the normal course of operation of the CT-2100, only one line at a time has data. During RTTY transmission, the CW data line is high and inverted RTTY data (Space high) is put out of pin 3. During the CW ID sequence, the DATA input is held high, and CW data is coming out of pin 3. In the case of the TS-930S, that output is used directly to key the FSK input of the transciever. IC2 is a TTL to ± converter and depending on how X1/$\overline{X}$2 and pins 2/3 are jumpered will provide either normal or inverted RS-232 levels for driving FSK or Baudot printer circuits. Pin 6 of IC1B (output B) provides opposite polarity TTL if that is needed for any application. Again, All outputs provide both the RTTY and CW ID data information. A suggested PC layout is shown in Figure 3 although the circuitry is non-critical and could be built using perfboard construction. More on construction and installation in a moment.

The primary importance of this interface is its ability to drive almost any FSK circuit that you will encounter and utilize the built in provision for CW ID in the HAL CT-2100 system. The CT-2100 already has a printer output that users may find satisfactory. The existing LOOP output does have one feature in that data in the loop such as the tape sender (TD) is applied to the transmit output of the CT-2100 via the LOOP SENSE circuitry. (MPS 3395 tied to the loop keyer transistor.) Nothing says you have to drive the Baudot printer with IC2. One method for driving the printer is described here, and is shown in Figure 2. RL is a 20W adjustable resistor to limit loop current to approximately 60 Ma. Depending on the available loop voltage, which should probably be no more than 175V, the value of the limiting

PLEASE TURN THE PAGE

resistor would fall somewhere in the area of 1.5K to 2.5K. Neither the voltage or the current are critical. Anything over 100V and 50-60 Ma. is satisfactory. Loop items such as the tape sender and printer selector magnets are tied in series with terminals A & B. Closing the switch tied to the collector of Q1 gives local loop operation. (The keyboard generator contacts, if any, are also tied in series with other items across A & B.) A reminder that tying too many selector magnets in series may give distorted and unreliable data in the loop.

Now we'll discuss the construction and installation of the interface and its connection to the CT-2100. First of all, it is recommended that owners of the CT-2100 system purchase the Customer Maintenance Manual from HAL if they have not done so already. Not that this interface cannot be installed without it. I just consider it good practice to have the technical manual even if you are not technically oriented. If something goes wrong with the equipment, and you have a competent local repairman who can handle digital circuits, he has a fighting chance of finding at least the simpler problems if he has a schematic. You might save a shipping trip back to the factory.

Connections to the interface module are made via a six wire harness to the top side of IC pins on the analog (Bottom) PC board. First remove the seven screws holding the digital (TOP) PC board. CAREFULLY remove the 24 pin connector with ribbon cable attached to the digital baord. I can't emphasize enough that great care must be taken when removing this plug. Work the connector loose, slowly, carefully and evenly taking care not to bend the fragile pins. Pry each corner evenly a little at a time until connector is free. Put this board aside for the moment.

You'll be making attachments to the pins of IC39 and IC41. These IC's are located in the rear-most row on the analog board. IC39 is third from the left end of the board and IC41 is fifth from the left. Ground wire of the interface board goes to any convenient ground location on the analog board. +12V wire goes to pin 8 of IC39. -12V wire goes to pin 4 of IC39. +5V wire goes to pin 14 of nearest 74LS74 IC. Data line goes to pin 6 of IC39 and CW line goes to pin 6 of IC41. With a small low wattage soldering iron, attach the appropriate wires to the IC pins from the top side being careful to avoid bridging adjacent pins. From here you have two options. You can bring these wires to a multipin connector installed in one of the spare holes that are located on the rear panel near the left side (as viewed from the front) corner. From there you can install the interface board in a separate little box with a pigtail lead with appropriate connector. However, the method I prefer to use is to install the interface board on short standoffs on the left rear corner of the digital board where there is an unused space made to order for this installation. The two output lines are then brought out through the two spare holes mentioned above, with short female phono pigtails. An ideal source for the two pigtail leads would be one of the short cable "Y" adapters available from Radio Shack. The reason I prefer inside installation is that there would be less chance for RF getting into the interface board. An outside pigtail multiwire cable, unless it was shielded could be a problem in this regard. Besides, the external box would be another item to take up space on the operating table. Inside installation is simple and neater.

Not shown in the schematic are power connections for IC1 and power lead bypassing. The +5V line is bypassed with a .1 Mf disc and 10 Mf electrolytic. Plus and minus 12V lines are bypassed with disc ceramics and provision is made on the PC board for these. IC1, pin 14 is +5V, pin 7 is ground. Pins 9, 10, 12 & 13 are tied to the +5V line. Pins 1, 5 and 8 of IC2 are not used.

There you have it. This interface should solve most interconnection problems that you will encounter when using the CT-2100 with various radio equipment, and Baudot printers such as the Model 15 or 28 and other printers using a high voltage loop system. There are no plans for the author to offer PC boards in connection with this project.

The "guinea pig" for the first installation was N1CPO and his interface has worked very well for him. The difference between receiving in the FSK mode and LSB has been quite significant, using the TS-930S. There is one difference apparent in the transmit mode. The MONITOR function of the TS-930S (And the TS-820S) is operational only in SSB so you cannot monitor your transmitted signal in FSK mode unless you employ a separate receiver. This is a small matter as many transcievers do not have a MONITOR function anyway. I always recommend listening to your own signal when first putting a new system on the air if you can. If not, it would be prudent to make a few tests with other stations checking for glitches and upside down transmit signal.

I hope other CT-2100 owners will find this interface board useful. I will be happy to answer individual questions provided that SASE is included. → Schematic on page 15

--73-- de K1LPS....

IN MEMORIUM

It is with great sadness that we report the deaths of the following RTTYers. They and their contributions to the world and green keyers will be missed by all of us.

Paul Johnson, KØPJ, author of many RTTY JOURNAL articles and President of San Diego Teleprinter Society.

Ron Guentzler, W8BBB former editor of VHF RTTY NEWS and major contributor to the RTTY JOURNAL Handbook.

Robert Weitbrecht, W8NRM author of many RTTY JOURNAL articles, inventor of communication system using Teleprinters with telephones for the handicapped.

Robert Clark, N6DYO, President of Palomar Amateur Radio Club.

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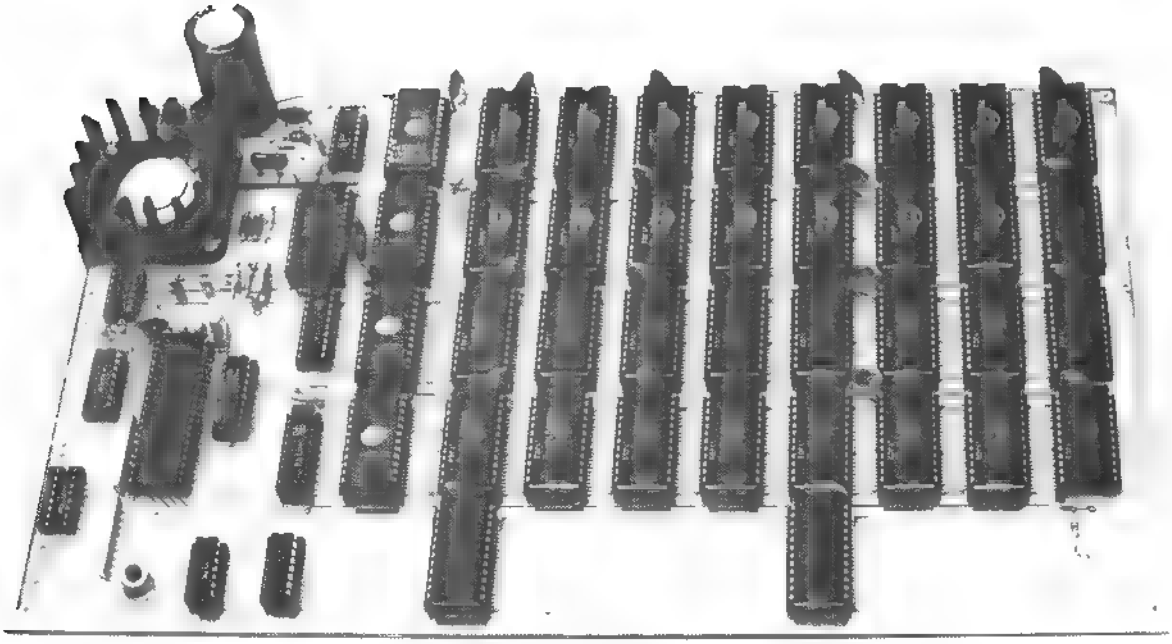

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RELAY SWITCHING BY RALPH IRISH, WA8GDT, POB 122, UTICA, MI 48087

Ask the typical Industrial Electrician (like myself) to design a relay circuit using only a normally open push button that will energize a circuit with one push, and de-energize it with the next push, and you will get something with timers, latching relays and perhaps some regular relays. I needed such a circuit for use with teleprinter accessories and although I did come up with a few working systems, they were complicated and bulky.

While reading an article in the August, 1972 issue of 73 Magazine, I found an article by W9SEK that had some of the requirements. I did try the circuit that W9SEK used, but I ultimately found another that was better for this one type of application. Better in the sense that it was it was a little simpler. I was teempted to write an article at the time, showing the circuit that I finally used, but failed to do so. Then a move to a new QTH put the idea out of mind for a few (10) years.

I can take no credit for the circuit, however. It has been used in its many variations for years in telephone switching systems. I found out about it through a friend who was then engaged in the new Telephone Interconnect industry.

There is a fly in the ointment, though, that can't be ignored. The relays involved must have a make-before-break contact configuration on one relay, and a conventional break-before make configuration on the other relay. (Two relays are required for each circuit.) I will use the same (telephone) symbols that W9SEK used in his article. This idea is not indended to replace Ron's circuit, but rather to supplement it. Each will find its own place of use that can't be filled by the other.

The most common relays that have the make before-break feature are the telephone (Western Electric) relays known as "wire spring relays. This is refered to in the telephone biz as a "transfer contact." And this feature can be found on push buttons, ¼" phone jacks that have auxillary switching as well as relays. The break before make type is as common as dirt, and needs no further mention.

In industrial catalogs, the make-before-break configuration is called an "overlapping" contact. In my 18 years of industrial work, I have never seen one on a blueprint or seen one in a control panel. But since the major manufacturers bother to list them in calalogs, there must be some use for them.

Basically, what happens when you first push the button is to energize one of the two relays and short out the coil of the other through a series resistor for as long as the button is depressed. Then when you release the button, the second relay becomes energized now that the short around the coil is gone. Now that both relays have their respective coils energized, all of the contacts are reversed. all normally open contacts are closed, and the normally closed contacts are open. The next time the button is pushed, the reverse action will take place. K 1's coil is now shorted out through the series resistor, and the button provides the holding path for the K2 coil for as long as it is depressed. Once the button is released the second time, you are back to the starting condition.

The most important point is, of course, to find relays that have the make-before break feature. In all of my years of catalog (HAM) browsing, I have never seen this feature advertized in any type of "plug in" relay. It may be available, but I've never noticed it. The second most important point is to choose the series resistor values, both resistance and wattage, with care. It will no doubt be a trial and error situation. In using the telephone style relays by Western Electric, I discovered that they are designed (in most cases), to operate on 24 to 48 volts. Some of them have two coils: one for operating, and the other for holding. The holding coil usually has a higher resistance to reduce power consumption during long periods of continous operation. I have found that most of them will operate on 3/4 to 2/3 of their "normal" voltage. So if the series resistor has half the resistance of the relay coil, the relay will see 3/4ths of the supply voltage, etc. The only time the resistor will see the entire voltage is when the button is being held down. So if you think that people, in their wonder at your new discovery will hold down the button over 10 or 15 seconds to see if they can foil it, choose your wattage rating with care.

Again, as W9SEK brought out in his article, Illuminated push buttons will enhance the overall effort and make it a pleasure to operate your station console. Since this circuit was shown to me by W8GBT, I have always been on the lookout for small, neat, inexpensive illuminated push buttons at swap and shops and flea markets.

One other item of note: The wire spring relays are usually sensitive enough to operate from the stunt box contacts of Model 28, 29 and 34 Teletype equipment, so that instead of a push button, you would wire in a stunt box contact to perform all kind of magical things with the same stunt box sequence. One good example which is in common on RTTY is "H-break" operation. This is used when both parties have their station equipment wired so that when a sequence of "FIGURES, BLANK H" is sent or received, the station will change from transmit to receive. This allows the transmitting station to control both stations for one operation. It is a great time saver for fast break operation. This same function can be accomplished with impulse latching relays just about as easily.

One last thing and I will leave you to run down to your local surplus emporium to dig through their supply of relays to look for some of these gems. In the wire spring type of relays, the common or "swinging" contact does not, in fact, do the swinging. It sits still and the other contacts move back and forth to do the making and breaking, so don't get

PLEASE TURN TO PAGE 5

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MORE ADS ON PAGES 5 and 14

HITS & MISSES

by GEORGE

GEORGE HAMMON, WA6CQW
14215 Pecan Park Lane Space 73
El Cajon, CA 92021

I have tried, for a number of years, to get an endorsable Rtty DXCC award issued by the ARRL. I felt the RTTY DXCC Honor Roll published in QST was also lacking and should become a reality. In October of 1979, I wrote a letter to Jay Holladaym W6EJJ the Southwestern Division Director. (See October 1979 RTTY JOURNAL for contents of my letter.) The purpose of the letter was to create a dialog with League officials and area RTTY Amateurs.

The meeting took place on October 19,1979 at the Southwestern ARRL Convention. This convention was held in Anaheim, California. The following people were in attendance:Jay, W6EJJ, Doug Demaw, W1FB, John Lindholm, W1XX Art Smith W6INI, Paul Gagnon, N6MA, Robert Smith WB6ODR, Dale Sinner W6IWO, Mae Washburn WA6LNH and George Boyd WB6INV.

The first subject was endorsable RTTY DXCC. John W1XX, explained the "current rules for DXCC did not provide for endorsements and was a one shot award." A strong signal was sent to the League officials present that RTTY Amateurs were willing to work, write and lobby to secure a stronger position for RTTY with the ARRL.

Many facets discussed at that meeting have come to pass. RTTY now has a strong place in the ARRL planning aand QST, as the years passed, contained more features on RTTY. We all wrote letters, buttoned-holed League officials at conventions and now our hard work is beginning to pay off.

I attended the DX convention in Visalia, California. My purpose was two-fold. I chatted with as many DX advisory committee members as I could find to lobby for an endorsable RTTY DXCC. The second was to find a place for our "specialized communications" in future DX conventions.

I was really impressed with the interest shown in both areas. RTTY is no longer a small vocal minority but our hard work must continue. I hope we all keep talking RTTY with other Amateurs and write to elected ARRL officials.

The Board of Directors of the ARRL met on April 21-22, 1983. Minute 65 of this meeting is as follows:

"65) moved and seconded by Mr. Stevens, seconded by Mr. Milius, that whereas, a growing number of ARRL members are equipping their stations for RTTY operation and whereas it is the policy of the League to encourage versatility in the use of various modes of emmission and whereas, ARRL has recognized the desirability of encouraging RTTY operation in a number of ways, including the issuance upon recommendation of the DX advisory committee of a RTTY DXCC award and whereas so as not to aggravate the workload in the DXCC branch, the award was made available initially without endorsement for levels of achievement above the basic 100 countries and whereas for a number of reasons including commendable efforts by the staff, the backlog in the DXCC branch has been reduced to managable proportions.

Now therefore be it resolved that endorsements for RTTY DXCC shall be available beginning 1 July, 1983, for contacts made on or after 15 November 1945 under the same provisions as apply to the CW and phone DXCC awards. After discussion on motion of Mr. Sullivan, seconded by Mr. Holladay it was voted that the matter is referred to the DX advisory committee, which is to report its finding to the board by the second meeting of 1983."

Earlier in the same board meeting at minute 33. The following caught my eye. "The committee also reviewed frequencies designated for RTTY in the League band plans, and worked with packet radio and RTTY groups to develop standards for digital communications. The committee is also tasked with developing a data communication directory and reviewing material for the radio Amateur Handbook and other League publications dealing with RTTY and digital communications"

This is a partial quote but is reprinted to illustrate the results of our perseverance to achieve recognition for the RTTY mode.

I will close out my column this month. I will be leaving on vacation and will be stopping at the Salina, Kansas ARRL convention. Please keep up the good work for RTTY.

So long for now..George, WA6CQW....

WANT ADS CONTINUED

IBM PERSONAL COMPUTER RTTY PROGRAM "PC/RTTY" program to send and receive RTTY Baudot or ASCII using your own PC and tuning unit. Features include: split screen receive and type ahead, up tp 1200 Baud continous speed coverage, five one-line message buffers, auto FIGS/LTRS, built-in CQ, RYRY, CW-ID, CLOCK, SIGNOFF MESSAGE and BRAG TAPE. Disc save and send text, status line and buffered keyboard features are included. Requires minimum 48K memory, one disc drive, 80 column monitor, asynchronous communications adapter, and your own EIA level RS232 compatible tuning unit. Furnished on single-sided disc with user manual. Price: $19.95 AMPWARE, POB 30279, Cincinnati, OHio 45230.

FOR SALE: DS-3000 KSR, also DS-2000 KSR keyboards. Both factory fresh. Also ST-6000 and a Dovetron MPC 1000R with cross display-memory-KOS-and more. If interested write or call after 6PM. 207-368-5295. Gerald Clark K1OVP, 32 High St., Newport, Maine 04953.

SELL COLLECTION OF 35 YEARS-receiving tubes boxed only one dollar each. Collins G 75-A4 receiver, 3 filters only $295. Drake 1-A triple conversion $100. HT 37 mint $125. Drake twins R4B with Satori modifications $275, T4XC only $290. W5QJT, POB 13151 El Paso, TX 79913. 915-581-2017

13TH S.A.R.T.G. WORLD-WIDE RTTY CONTEST 1983.

We have the great pleasure to invite you to join the 13th W/W RTTY Contest run by the Scandinavian Amateur Radio Teletype Group.

Rules:

1. Test Periods: 1: 0000-0800 GMT Sat. Aug. 20
   2: 1600-2400 GMT Sat. Aug. 20
   3: 0800-1600 GMT Sun. Aug. 21
2. Bands: Use all bands: 3.5 - 7 - 14 - 21 - 28 Mhz.
3. Classes: a) Single Operator.
   b) Multi Operator, single transmitter.
   Note: Logs from Multi Operator stations must contain the names and call-signs of all operators involved.
   c) SWL's.
4. Exchange: RST and QSO nr.
5. Points: QSO with own country five (5) points. Other country in same continent ten (10) points. Other continent fifteen (15) points. In USA, Canada and Australia each call-district will be considered as a separate country. The same station may be worked once on each band for QSO and multiplier credits. Only 2-way RTTY QSO's will count.
6. Multipliers: Use the DXCC List and each district in W/K, VE/VO and VK.
   Not : Conta ct with a station which would count as a multiplier must be found in at least 5 logs, or contest logs from the multiplier station must be received in order to be valid.
7. Scoring: Sum of QSO points x sum of multipliers.
8. SWL's: Use the same rules for scoring, but based on stations and messages copied.
9. Logs: Logs must be received by October 1oth 1983. The logs to contain: band, date, time GMT, call-sign, exchanges sent and received, points and multipliers. Use a separate sheet for each band and enclose a summary sheet showing the scoring, classification, call-sign, name and address: in the case of multi operator stations, the names and call-signs of all operators involved. Comments will be very much appreciated. Send logs to:
   S.A.R.T.G. Contest & Awd. Mgr.,
   OZ2OJ O.J. Jensen
   P.O. Box 717
   DK 8600 Silkeborg
   Denmark.
10. Awards: To the top scorers in each class, country, W/K, VE/VO and VK call district.

ASCII BAUD RATES VS. ERRORS by Edward Trego, W9WKC

856 E. Washington St., Hoopeston, IL 60942 and Henry Hall, K4CZ, Box 4151, Lexington, KY 40544

With reference to our article in the February issue of the RTTY JOURNAL entitled "CASE FOR 45 BAUD ASCII", we said we would further test the other ASCII speeds.

We began our tests on December 12th,1982, and continued until January 23rd,1983. During that time we made 35 transmissions to each other for a total of 70 transmissions both ways. Each transmission consisted of sending ten lines of "Quick Brown Fox" at each baud rate or 600 characters at every ASCII speed we used. Our power output was five to ten watts and both used HAL DS3100 ASR's. The frequency used was 7098.5KC.

There are approximately 300 miles between our two locations and tests were conducted between three and four o'clock in the afternoon EST. In the event that an interfering station blocked out reception of any particular ASCII baud rate, that particular speed was done over again. We wanted to depend wholly on atmospheric and propagation conditions for any errors incurred. At out low power it would not take much in the way of an interfering signal to block out reception. For the most part, we stayed relatively free of interferring signals and very probably the time of day chosen kept the interference to a minimum.

At the conclusion of the tests we added up all the

FIG. 1

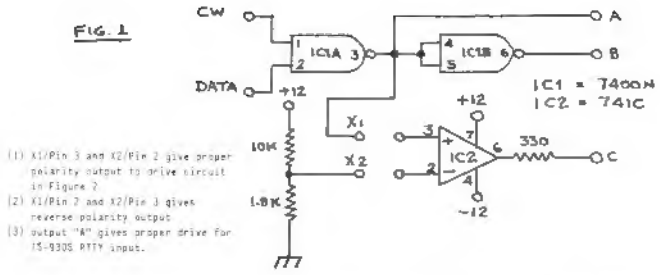


FIG. 2

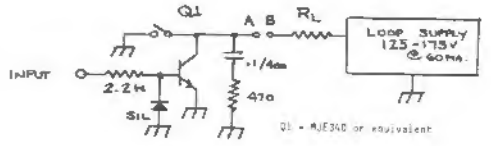
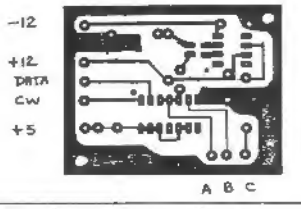


FIG. 3



errors which were received by both stations and the results are quoted in percentage of total characters transmitted by both stations for each baud rate. For example: 110 baud rate shows .048 which is 4.8 percent of 42,000 characters as errors.

The following table gives the error rates as percentages of all bauds used: 45 baud ASCII - - .001, 57 baud ASCII --.002, 74 baud ASCII - - .005, 110 baud ASCII .048.

It is readily apparent that there is a large jump in error rate from 74 to 110 baud. From ½ of 1% to nearly 5%. There is also a great jump in words per minute from 74 to 110 baud. The one large increase in error rates presents considerable difficulty in plotting the error table on semi-log paper that the data did come as a straight line or close enough to be called one. From the graph any baud rate from 45 to 110 can be selected and its probable error rate noted.

We did not carry our tests at any higher baud rate than 110 since actual practice has shown the 110 is so unsatisfactory that we did not believe any faster rate would enhance the value of the experiment.

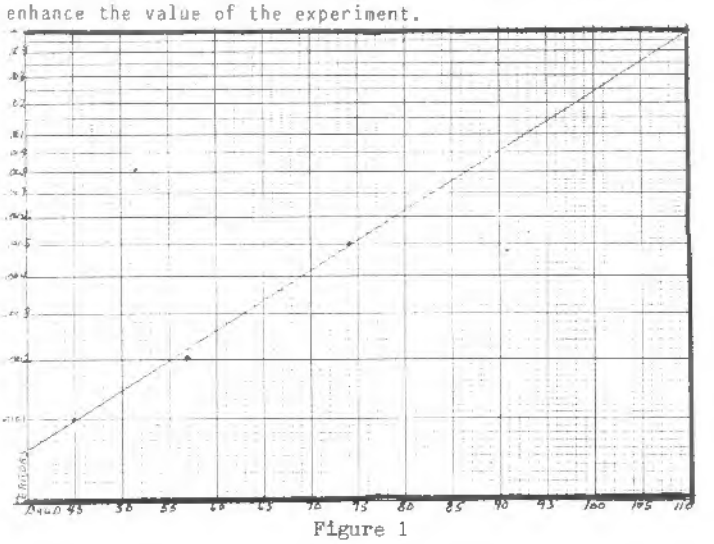
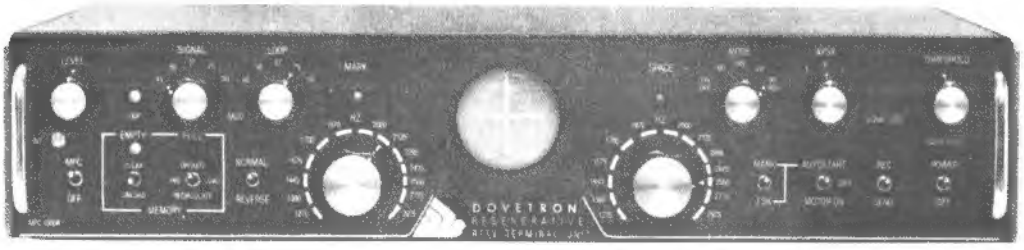


Figure 1

MPC-1000R BY DOVETRON

MULTIPATH CORRECTION, IN-BAND DIVERSITY, SIGNAL REGENERATION, UP-DOWN SPEED CONVERSION, 200 CHARACTER FIFO MEMORY, KEYBOARD-CONTROLLED WORD CORRECTION & DIGITAL AUTOSTART



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The MPC Series is available in six different models to meet your exact requirements.

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